

UNIV. DE FRANCHE-COMTE

DARROWAN PROD

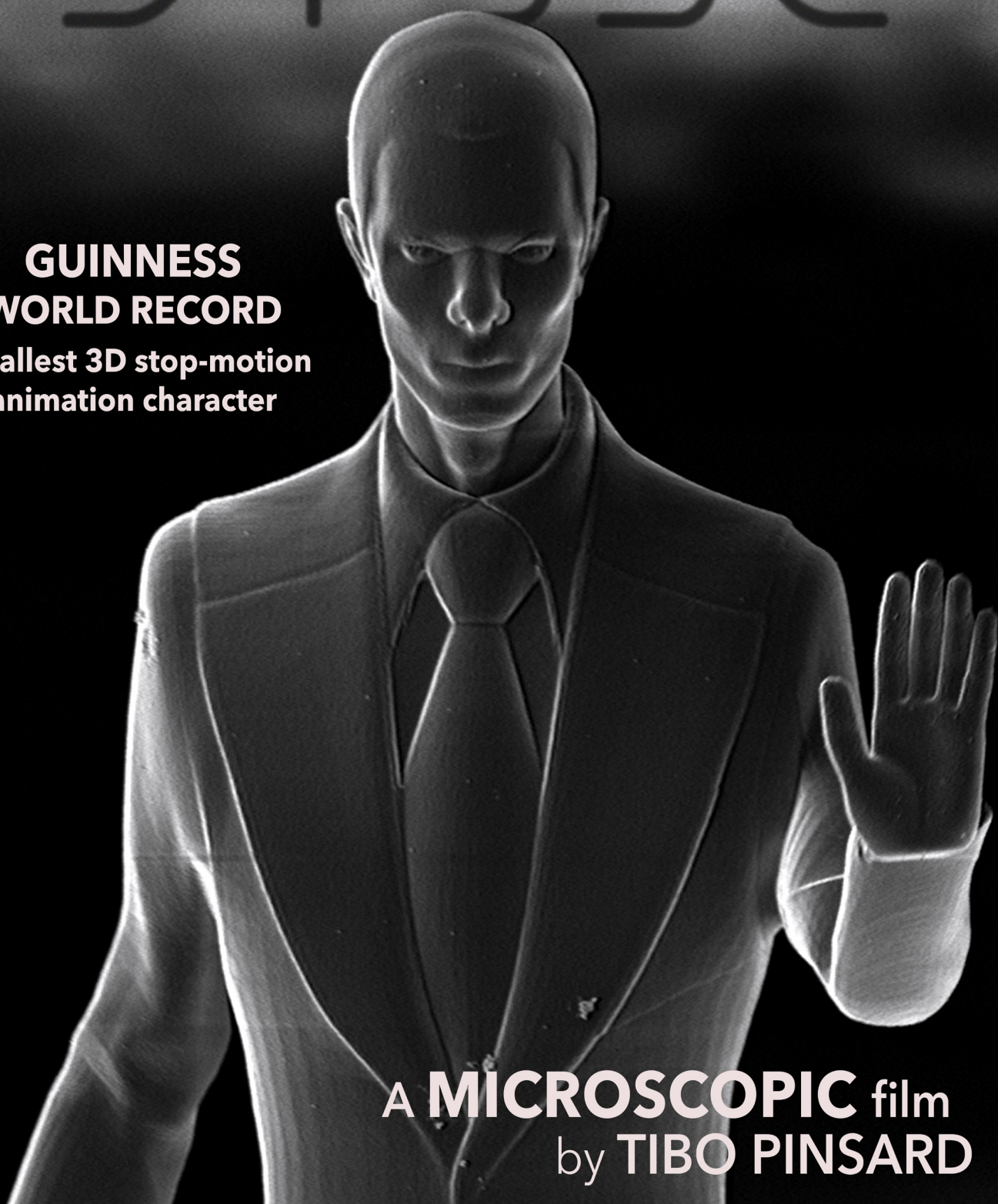
UNIV. LIBRE DE BRUXELLES

PRESENT

STARDUST ODYSSEY

**GUINNESS
WORLD RECORD**

**Smallest 3D stop-motion
animation character**



A MICROSCOPIC film
by **TIBO PINSARD**

PITCH

In the microscopic entrails of a vinyl record, a speck of dust transforms itself into a humanoid creature and comes to life just when an intriguing black star comes over the horizon...



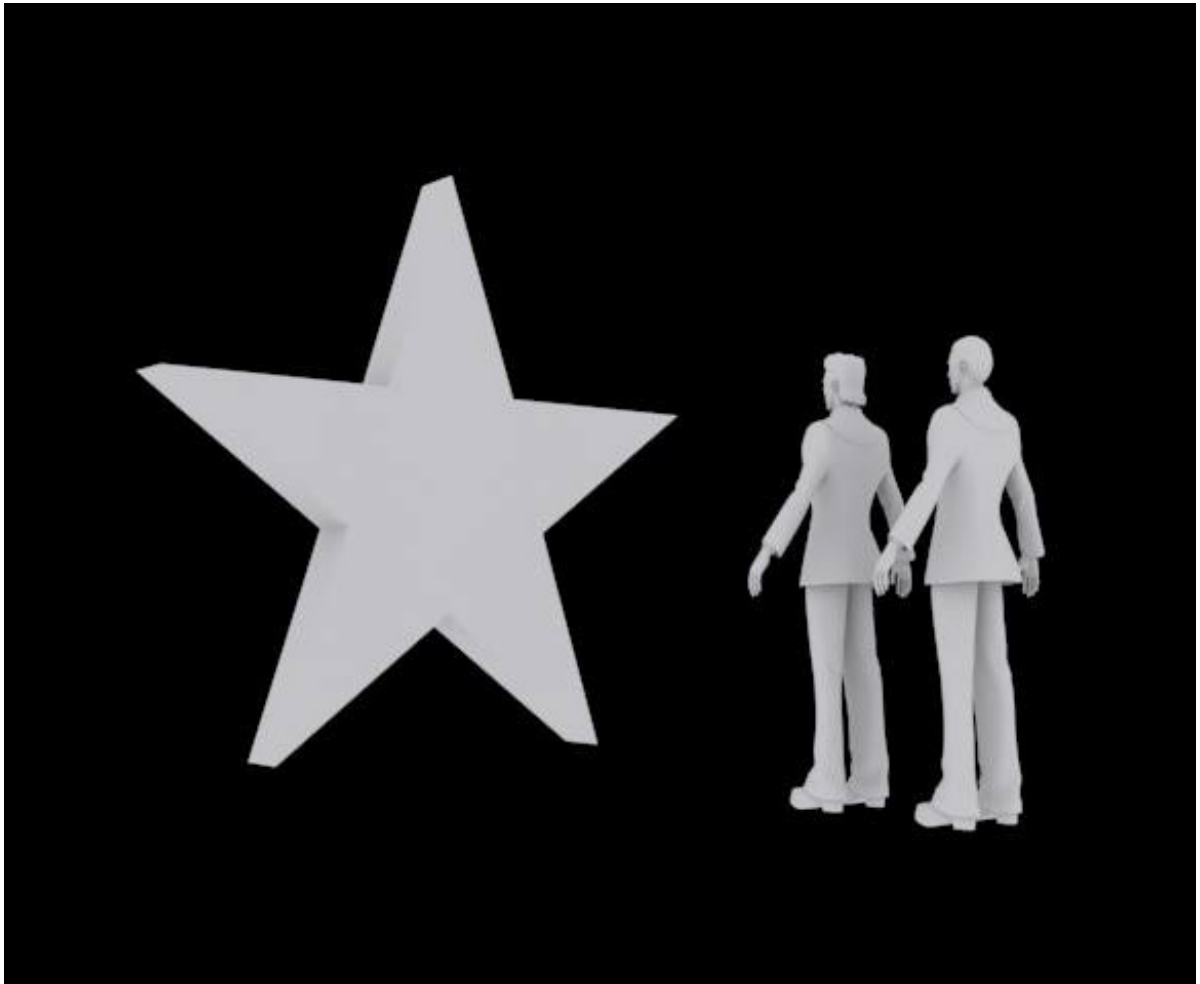
GUINNESS WORLD RECORDS

Smallest 3D Stop-motion Animation Character.

SYNOPSIS

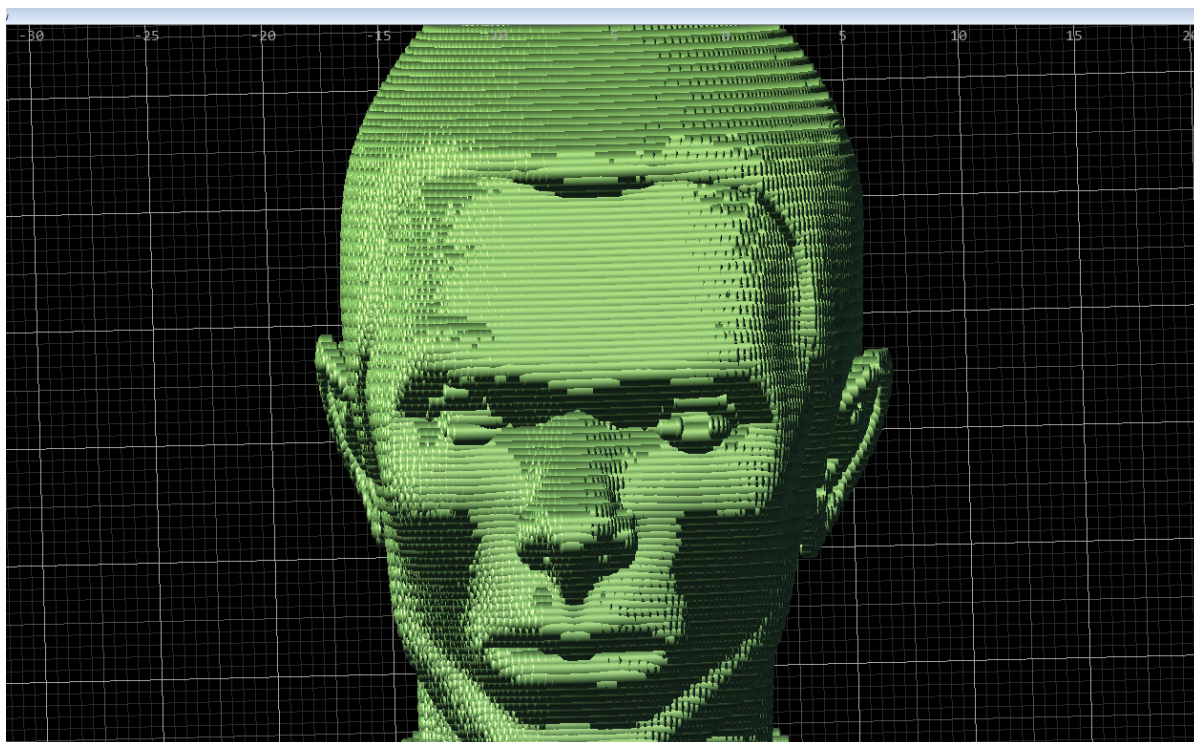
In the microscopic entrails of a vinyl record, a speck of dust comes to life and transforms itself into a humanoid creature. The being comes alive and stands up. On the horizon in front of him a black, star-shaped monolith attracts his attention. There's only one thing to do: go and look it at from up close.

As it gets closer, the monolith starts the being's heart beating. He finally, hesitantly, touches the monolith. The monolith's effects suddenly grow stronger: the humanoid's hair turns red and then grows longer into a Ziggy Stardust-like mullet cut. Once the transformation is complete, the character comes to a standstill and the plunge into the infinitely small begins...



THE DIRECTOR'S WORDS

- WORLD PREMIERE -



Stardust Odyssey was born from me wanting to explore a universe that has not yet been seen in a film or a cartoon: the infinitely small, seen through a scanning electron microscope.

The distinctive aesthetics of this universe, in shades of grey, where the merest speck of dust becomes a rock, with visual tricks, astonishing details of matter, the effects of electron charges, the coupling of lines of electric fields between figurines... All these elements combine to create a visual world which is as yet unseen in animation films.

To this universe, which can only be accessed by using cutting-edge technologies, I wanted to associate a hand-crafted animation technique dating back to the very beginnings of cinema: stop motion animation. But there too, I needed to make use of hi-tech which would enable me, notably, to print the microscopic figurines which are to be animated. It should be noted that this is the first time that a scanning electron microscope has been used as a camera to shoot an animation film.

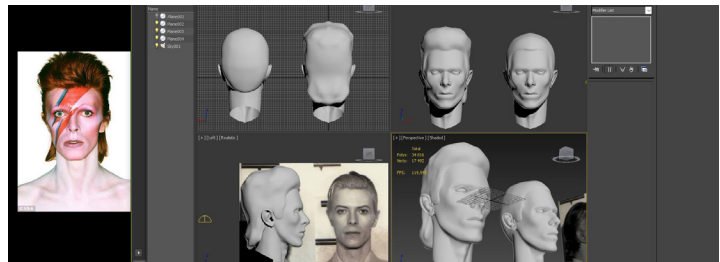
- THE STORY AND A TRIBUTE TO DAVID BOWIE -

A film is more than just a technological challenge: it is primarily a story. Stardust Odyssey had to be an easy one as it integrates countless constraints inherent to the animation process on a microscopic scale.

For technical reason (total absence of water), the microscopic universe is shot in a vacuum. The universe is therefore lunar, and I was keen to bring in some form of life, by literally transforming a speck of dust into a humanoid creature. Hence the character comes to life, stands up, walks, discovers how his heart beats and gradually becomes truly himself as the film unfolds. Ultimately, it is through animation that life is created.

This story was born shortly after David Bowie passed away. Being a fan both of his music and his universe, I wanted to render a discrete homage. Though relatively short, Stardust Odyssey is packed with references to the artist. The title of Bowie's record, Space Oddity, was inspired by 2001 A Space Odyssey. The black star in my film refers of course to Blackstar, the name of his last album. And those are just a few examples...But of course, it is still possible to enjoy Stardust Odyssey without fully understanding the references to the singer-songwriter.

But what connexion might David Bowie have with a film taking place on a microscopic scale? It's because all through his life, this British-born artist was a pioneer always looking to innovate, including on a technological level. In my opinion, he would not have looked out of place in this universe, whose scale is proportionately opposite to that of his talent. Although he has himself now gone back to being just specks of dust, Bowie's works live on and still influence many of today's artists.



- THE RECORD -

In 2010, Nokia and Aardman Studios (Wallace & Gromit) produced Dot, a very short animated film for the promotion of the mobile phone brand. In so doing, they set the smallest (10 mm), stop-motion animation character record (World's Smallest Stop Motion Character), certified by Guinness World Records on 1st September 2010. With Stardust Odyssey, this world record is broken. The microfigurines used for the animation, which are almost invisible to the naked eye, measure 300 microns, ie 0.3 mm (compared to 10 mm previously). The Stardust Odyssey character is therefore 33 times smaller than Dot's.

MAIN STEPS IN PRODUCING THIS FILM

1. Writing the synopsis and storyboard for the director.
2. Modelling the 3D figurine to be used as a model for printing the micro-figurines.
3. Animating the figurine in front of a backdrop using computer-generated images, according to the storyboard and the director's indications.
4. Selecting the character's key positions in the computer-generated backdrop (with a view to creating 12 images/second animations). These are then converted into files which can be read by a 3D printer (stereolithography).
5. Processing the stereolithography files (3D printing), then printing the micro-figurines in the laboratory at ULB-TIPs (Brussels, Belgium) using a photosensitive resin.
6. Metal-plating the figurines with a 20 to 40nm layer of chrome in order to make it possible to produce electronic images using a scanning electron microscope.
7. Shooting the figurines using equipment provided by the MicroRobotex platform (Femto-ST, Besançon), notably a scanning electron microscope fitted with a robot. A collaborative robotics technique was specially designed in order to make the scenes and the black star move past the microscope lens (which, unlike a standard camera, cannot itself move).
8. Colouring the hair (red) using image processing software.
9. Animating the images using video editing software.
10. Creating the sounds, music and mixing.



KEY FIGURES

6 Years. That is how long it took to make the film. From the first (unfinished) version to the final one. This itself took three years to make.

250 It is the number of micro-figurines printed and seen in the film. Given that time-consuming tests would be necessary for the printing and the fine-tuning of the metal-plating process in order to obtain the images, surplus micro-figurines were printed as back-ups.

300 Microns. Corresponds to the size of the micro-figurines used in the film. Or, in other words, 0.3 mm (one millimetre being equivalent to 1000 microns). The size of the hands (n.b. all the fingers are printed, too) or the faces is therefore considerably smaller.

12 Represents the number figurines animated per second

TIBO PINSARD

FILM DIRECTOR AND SCREENWRITER

Tibo Pinsard has directed fiction films (short films and mini-series) and documentaries. His short film, entitled *Gorilla*, has won awards at film festivals all over the world (46 awards and 121 nominations). He is currently working on several projects to produce feature-length movies and series. *Stardust Odyssey* is his first animation film.



A SELECTION OF HIS FILMS



2020 - *Une femme au coeur de l'illusion*, a documentary film produced by Camera Lucida for France Télévisions, currently in post-production.

2020 - *Sans Permis*, a series produced by Wanda Productions. Currently at the development stage.

2019 - *Pet Killer*, série a digital series lasting 10X10 minutes, produced by Deadrock (Australia) and Rockzeline (France) for Blackpill.

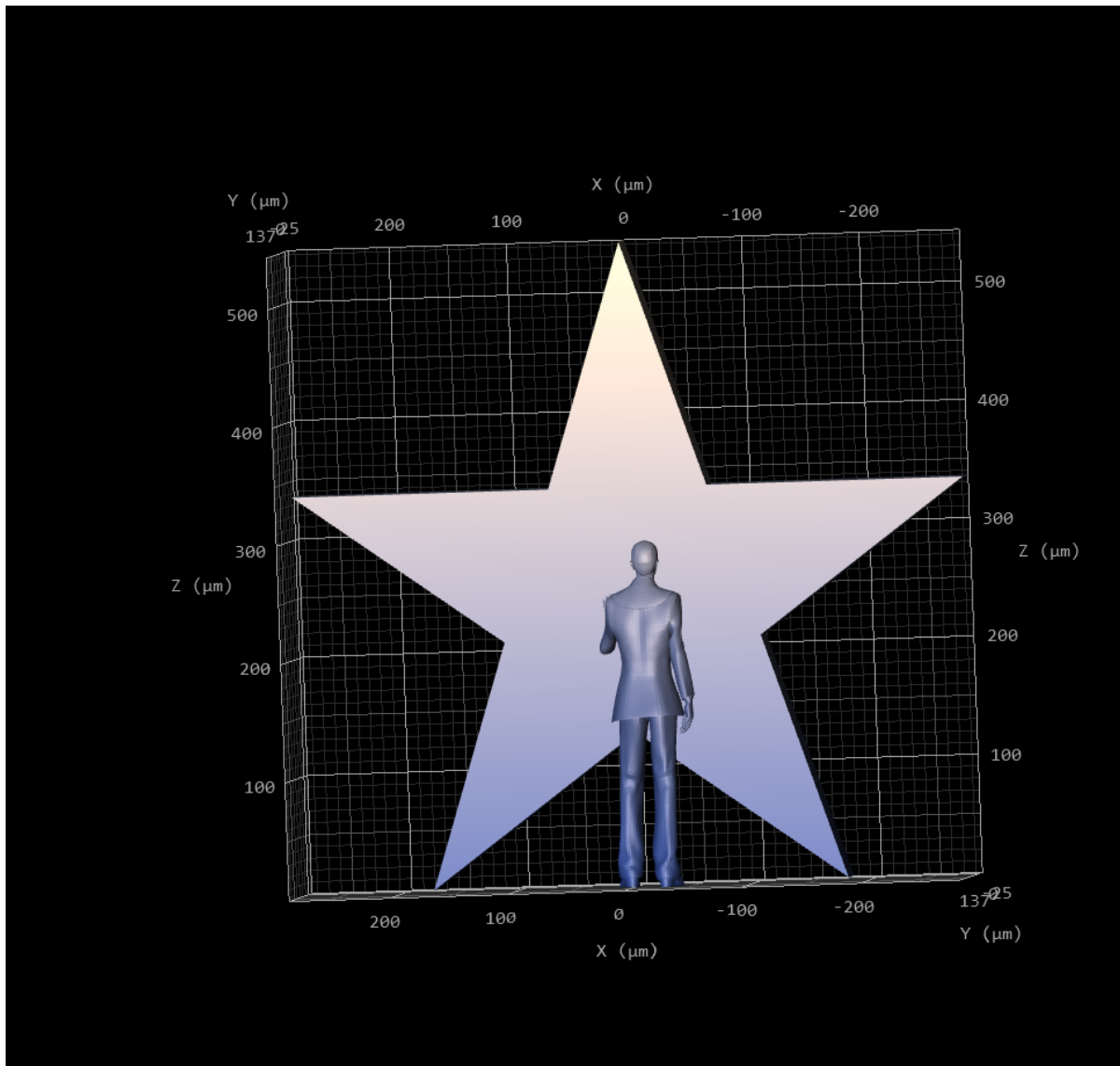
2019 - *Montreuil*, produced by Wanda Films. Currently at the development stage.

2016 - *Gorilla*, a short film produced by Darrowan Prod. 46 awards and 121 nominations. Ran for an Oscar nomination for the Best Short Film in 2017

2016 - *Stripes*, short film produced by Darrowan Prod, 5 awards et 35 nominations.

DARROWAN PROD

Darrowan Prod is an audio-visual production company co-founded in 2013 by different film directors, two of whom are Tibo Pinsard and Michaël Houdoux. Since being set up, the company has produced several short films, notably “Stripes” (with Maud Baecker) and “Gorilla”, which were both written and directed by Tibo Pinsard, the director of Stardust Odyssey. Darrowan Prod’s aim is now to develop many more audio-visual projects based on strong and original concepts which provide real “production value”.



INSTITUT FEMTO-ST

The Institute is a joint research institution, which is under the authority of four institutions: the Université de Franche-Comté (UFC), the Centre National de la Recherche Scientifique (CNRS), the Ecole Nationale Supérieure de Mécanique et Microtechniques (ENSMM) and the Université de Technologie Belfort-Montbéliard (UTBM).

The Institute has around 750 members and is one of the largest public laboratories in France. Its main fields of research are in Physical science, Engineering and Information and Communications Technologies.

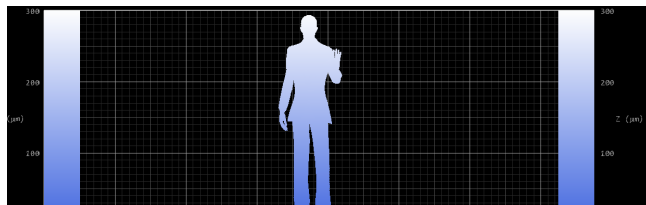
The technological equipment required to produce this film was a robotic manipulation platform using a scanning electron microscope (ROBOTEX –PIA EQUIPEX platform). The platform was developed firstly for scientific research but is also adapted to industrial purposes. It can be used to perform complex assembly and positioning operations involving objects which are less than one millimetre, and sometimes even less than a micron, in size. The filmset itself was built within a closed vacuum about 20 cms wide and equipped with an electronic microscope which can only be operated by high-precision, miniature robots which constitute a mainstay of FEMTO-ST's know-how.

TIPs

The research carried out at the Transfers, Interfaces and Processes (TIPs) laboratory of the Université libre de Bruxelles (ULB) is into the experimental characterization and the mathematical modelling of transport phenomena taking place within systems containing several phases (gas and/or liquid and/or solid), exchanging matter, heat or momentum, through an interface between these phases. The scales in question vary between the micron and the millimetre.

This research, which is on mainly fundamental and/or generic questions, may have numerous potentially direct applications in the fields of health, environment, heat transfer technologies and agro-food, chemical, microtechnology, materials and space industries. The *Stardust Odyssey* figurines were manufactured thanks to our access to the array of equipment provided within the Micromilli platform.

GLOSSAIRE



Scanning Electron Microscope (or SEM)

An SEM is a type of electron microscope that can produce high resolution images of a sample via the principle of electron-matter interaction. The visual images of the details correspond to shades of grey which represent the intensity of electrons emissions reflected by bombarded surfaces. They are not photos.

Stop-motion

It is the same technique as that used for cartoons, only it uses objects. A scene, made up of objects, is filmed with a camera (in this case, the SEM) which takes one photo after another. Between each still frame the objects are moved slightly.

Stereolithography or 3D Printing

This is a technique, aka rapid prototyping, which is used to fabricate solid objects from digitalized models. The technique uses a photosensitive resin which hardens when subjected to a focussed laser ray which forms a spot. The developments are carried out in the TIPs laboratory at ULB.

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FICHE TECHNIQUE

Based on an original concept
by Michaël Gauthier and Tibo Pinsard

Tibo Pinsard. production, scenario, storyboard, directing

Michaël Gauthier. CNRS researcher / FEMTO-ST Instituts (CNRS, UFC, ENSMM, UTBM)

Rémi Métral. modelling the characters

Angélique Moutarde. rig design and animating the digital backdrop

Youen Vitry. (TIPs laboratory, ULB, Belgium). 3D printing of the micro-figurines

Pierre Lambert. (TIPs laboratory, ULB, Belgium). supervising the MicroMilli

Technical platform

Olivier Lehmann and Jean-Yves Rauch (FEMTO-ST laboratory, Université Bourgogne Franche-Comté, France). developing the system for shooting the still frames using electronic imagery, directing the shooting.

Iutokintumi. animating the vinyl record crash-zoom and graphics

Alexis Jung. sound design and mixing

Nicolas Pinsard. music

Michaël Houdoux. directing the behind-the-scenes film

Darrowan Prod. delegated production

A Darrowan Prod, Université de Franche-Comté (Femto-ST), Université libre de Bruxelles (TIPs) coproduction.

With the support of the conseil régional de Franche Comté, the Centre National de la Recherche Scientifique (CNRS) and ENSMM.

DISCOVER THE FILM

Stardust Odyssey available on November 27th, 2019 on:
<https://youtu.be/DoJLtM6jHa4>

The behind scenes documentary:
<https://vimeo.com/373417476>

Film website: stardust-odyssey.com